



Hanovia Ultra-violet ray lamps :

THE 'PRESCRIPTION U.V. LAMP'
THE WARD LAMP (Model IV)

Instructions for Assembly, Installation, and Operation



Issued by HANOVIA LTD., SLOUGH, Bucks

Booklet S. 2566/4603

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(N.B.—References are to paragraphs, not pages.)

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INTRODUCTORY

(1) The two models covered by these instructions are identical as regards arc tube, reflector, characteristics and output. *The Ward Model has extra fittings, and its additional assembly is described in distinctive type as here.*

ELECTRICAL

(2) See that the lamp is set for operation on the correct electrical supply and correct line voltage for the premises. Normally, a domestic lighting supply with 5-ampere fuses in circuit will easily carry the starting load (except the 110-volt A.C. lamp: see table; paragraph 4).

(3) **Low voltage supplies.** These lamps cannot be supplied for operation on Direct Current mains of less than 190 volts pressure.

For Alternating Current mains of 100 or 110 volts, an auxiliary **Step-up Transformer** may be supplied, to be operated in circuit with the lamp. It consists of a canister shaped assembly, about 11 inches tall by 6 inches in diameter, with an "Off" and "On" switch and 3-hole socket fitted above. The primary coil has two tapings (100 and 110 volts) and is adjusted for the user's specified pressure before despatch from works. The lead from the base of the transformer forms the mains connection. When the mains conform to the specified voltage, the current from the secondary (delivered through the socket and plug above the transformer) will be at a pressure of 230 volts, and this is the setting to which the Control Unit of the lamp itself should be adjusted.

(4) Operating Factors (Reference Table).

Supply and Voltage.	Starting Load (Amps.).	Running Load (Amps.).	Burner Voltage.	Unit consumption (Watts).
A.C. 190-210	5-6	2.2-2.4	115-125	300
A.C. 220-230	5-6		120-130	300
A.C. 240-260	5-6		120-130	300
D.C. 190-210	5		110-120	460
D.C. 220-230	4.5	5-6	115-125	500
D.C. 240-260	4		115-125	550
A.C. 100-120	10-12		120-130	350

UNPACKING

(5) For inland transport, each Prescription Lamp is normally packed in a carton. (*Ward Lamps, and all lamps shipped overseas, are packed in wooden cases.*) A Packing slip, giving an inventory, will be found just inside the lid of one of the cases. Remove all lids intact and check the items against this list.

The Ward Lamp Upright will travel separately in a wrapping tube.

(6) **Economy.** Whenever feasible, wooden packing cases should be returned, including all packing material. Replace this in the empty case, nail the lid on, and send back the case as "returned empty" to Hanovia Ltd., Slough, G.W.R. The value of such cases will be credited on receipt in sound condition. *Cut the upright wrapping tube into shorter lengths, just fitting into the case, and return them inside. They can be used again and will save paper.*

(7) The items to unpack comprise:—

(a) **The Control Unit** with 2 lengths of flex attached.

(b) **The Reflector and Fork.**

(c) **The Arc Tube**, in carton.

(Any accessories ordered.)

For the Ward Lamp, unpack also:

(d) *The Base, with castors attached.*

(e) *The Bracket.*

(f) *The Upright.*

Examine all parts on receipt. Look closely at the Arc Tube and see that the quartz is intact. (Do not finger the quartz tube: see paragraph 9.)

ASSEMBLY ("Prescription" Lamp).

(8) Attach the Reflector to the handles of the Control Unit by bolting the Fork into the swivel-mounted channelled attachment. Unwind both flex leads. Attach the upper lead to the Reflector by means of the hole plug provided.

(2)

(9) Handle the Arc Tube by the metal parts only. (If the transparent quartz tube is accidentally fingered, breathe on the tube and remove the marks with a clean, non-fluffing cloth before lighting the tube. Any dirt or grease left on the quartz will etch into it when hot, and reduce its output.)

Fit the arc tube gently on to the longer metal pin inside the reflector until the mounting engages the short metal pin. Secure in place by tightening the screw on the right. Slacken the bakelite-headed screws in the square bakelite terminal blocks and connect the beaded leads to the metal pins below the arc tube by pushing the terminals fully over the pins, then secure by screwing up the bakelite screws finger-tight. (Loose contacts at these points might cause damage to the arc tube.)

(10) **Connect to Supply Mains.** Six feet of triple wire are supplied with the lamp. If the lamp is to be used on an earthed outlet (advisable but not essential) connect all three wires, making sure that the "E" wire is connected to the earth pin of the plug. For a 2-socket outlet, connect only the 2 terminal wires. (NOTE.—D.C. lamps have no polarity, and either wire may be made positive or negative.) Owing to the variation in fittings, plugs are not supplied with the lamp.

ASSEMBLY (The "Ward" Lamp).

(11) Set the castor-fitted base on the floor, and loosen the round-headed screw at the back of its central round hole. Insert the Upright into this hole and secure by tightening the screw. Fit the Control Unit into the recess of the base, handle uppermost and switch facing away from the upright. Fit the Bracket Arm by its sleeve over the upright, hook downward, and secure at convenient height by the tightening screw. Fit the Metal Cap into the top of the upright. Fit the Reflector to the end of the bracket by bolting the Fork into the channelled attachment provided. Attach the plug-fitted lead from control unit to reflector, passing the flex over the hook.

Fit the Arc Tube as detailed in paragraph 9.

Connect to mains as described in paragraph 10.

(3)

PRACTICAL APPLICATION

(12) **Never start the lamp until the operator himself and any other persons exposed to the rays have put on goggles.** (Even short exposure of the naked eye to the direct rays of the lamp may cause an acute conjunctivitis which, although transient, is so severely painful a few hours after exposure that it must be avoided.) Reflected rays from wall or floors are comparatively safe for a few minutes, but not for prolonged exposures.

(13) **Start the Lamp** by (a) connecting the plug to mains, (b) pressing down the tumbler switch in front of the control unit, (c) pressing and releasing the red starter-button. The arc tube should start immediately, first with a flickering glow, followed quickly by an intense arc which builds up to its full intensity after about 3 minutes. Do not start exposure or switch off the arc during this warming-up period. (The arc will sometimes start on the switch alone. At other times, it may be necessary to press the starter-button more than once. Never keep this button pressed down.)

(14) **Exposures.** These two lamps are designed for the individual treatment of patients under professional direction, and the physician in charge of the case will prescribe the dosage, method of exposure, and frequency of repetition according to individual needs.

(15) **Exposure Factors.** The intensity of a lamp varies at different distances. The following exposures with a "Prescription" or "Ward" Lamp represent equal doses of ultra-violet rays:—

Distance (inches).	Intensity. m/watts/cm ² of E.U.V.	Exposure. min. sec.	Dose (Ergs/E.U.V.)
24	580	1 30	520,000
30	385	2 15	
36	290	3 00	

(E.U.V. means Erythemogenic Ultra-Violet, and designates the rays of 3200 A.U. and shorter wave-lengths.)

The exposures stated above are all equal to the "Minimum Perceptible Erythema" dose (M.P.E.) as defined by the American Medical Association. In practice, this dose is not likely to produce a visible reaction on average subjects but may prove about right for fair-skinned blondes. The actual time of correct initial exposure for any subject can easily be determined by skin tests on small areas of untanned skin, chosen on a sensitive area of the body. One simple method is to cut 3 holes, about 1 inch diameter and $\frac{1}{2}$ inch apart, in a paper cuff which is then banded around the arm to expose its inner surface. At 30 inches distance, expose all holes to the lamp (running at full intensity) for 2 minutes, then cover one; expose 1 minute longer and cover a second; expose 1 minute longer and finish. The test areas have thus had exposures of 2, 3, and 4 minutes respectively, which should "bracket" the correct dose; inspection say 12 hours later will show which manifests the required reaction.

(16) **Erythema Reactions.** The characteristic reaction of the human skin to ultra-violet rays, known as an "erythema," is a suffusion of the arterioles and capillaries which flushes the skin faint pink to deep red according to its degree. This flush does not appear until a few hours after exposure and fades again more or less rapidly. It shows that the high energy which is the marked characteristic of ultra-violet rays has produced a photo-chemical stimulus, exhibited on the skin and transmitted by the blood to every organ of the body.

Second, third or fourth degree erythemata are therapeutic reactions and the lamps described in this booklet are unsuited for their production. The characteristic tonic reaction is the first degree erythema, which may be defined as follows:—

A very faint pink flush on the skin some hours after exposure which fades out in about 24 hours and leaves no noticeable skin-peeling or pigment. The entire body, or the entire trunk, may be exposed at each session, and the dose may be repeated immediately on subsidence. The systematic reaction will hardly be felt by the subject.

CARE OF THE LAMPS

(17) **The arc tube** should always be clean before use. Breathe on the quartz and polish with a clean, non-fluffing cloth. (Pure carbon tetrachloride may be used, but only very occasionally, and the tube must be dry-polished before it is started after such cleansing.) The Reflector should be kept clean at all times.

After an exposure, if the lamp is to be used again after a short interval, keep it running; frequent extinction and re-starting causes much more wear on the arc tube than long runs. The reflector may be rotated over the arc tube to reflect the rays vertically downwards during such interim periods and thus obviate the necessity of wearing goggles at such times.

(18) **"Ageing."** Some progressive falling-off in output is inevitable during the operating life of the arc tube. Provided that the user takes due care of the tube as instructed, this ageing will occur at a known rate and its effects can be counteracted by increasing the exposure or reducing distance:—

After the tube has operated for about	200 hours	700 hours	
either increase original time by ...	$\frac{1}{4}$	$\frac{1}{3}$	} Refer to para. 15
or reduce original distance by ...	$1/10$	$1/7$	

(19) **After use** extinguish the lamp by moving the tumbler switch to "OFF"; disconnect the plug from mains, and put the lamp carefully away. The flex connector should be coiled neatly to avoid kinks or wear. The arc tube is best left mounted in the reflector in the house, but for transport outside it is advisable to dismount and pack the tube in its carton.

TROUBLES AND FAULTS

(20) **The arc tube** should give a thousand hours of steady operation and no difficulties should normally be encountered during this period, which means months or years of actual use.

(6)

It may, however, occur that

I.—The arc tube fails to start. Take action as under:—

- (a) See that the mains fuse has not burnt out.
- (b) See that connections are sound throughout the circuit, especially in the outlet socket and plug. (With Direct Current lamps it may occur that the high-voltage resistance has burnt out. This is the small cylindrical resistance mounted on the starting transformer under the Control Unit mantle; it should be returned to makers for replacement.)
- (c) If a high-frequency set is available, test the vacuum of the arc tube by bringing the "live" H.F. electrode close to the tube with current switched on. It will then show either:
 - A blue glow, indicating good vacuum.
 - A pink glow, indicating partial vacuum. (*Faulty.*)
 - No glow, indicating total loss of vacuum. (*Faulty.*)

Return any faulty tube to the suppliers, with its Test Certificate (supplied with the lamp) filled in, stating the trouble and the estimated hours of use.

II.—The arc tube may go out after burning a short time.

If this trouble recurs, it is probably due to excessive fluctuations of voltage on the supply mains. Complaint should be made to the electrical supply authorities.

Under-voltage is the most probable cause. In present conditions the authorities may be unable to correct this trouble, in which case (since a drop in statutory voltage may not only cause such trouble, but may also lower the output of the lamp quite disproportionately) it may be necessary to reduce the voltage setting as under.—

(7)

(21) Voltage adjustment.

- (a) Disconnect the mains plug.
- (b) Take out the round bakelite plug in front of the control unit. (This is a dummy plug, secured by one screw.) Slide the plug up its lead towards the reflector, but leave the terminals connected below it.
- (c) Lay the lamp on its back to expose the base. Take out the two large cheese-headed screws right and left, thus loosening the mantle.
- (d) Set the lamp up and remove the mantle (with reflector attached) by sliding it upward and forward. This exposes the electrical circuit.
- (e) The largest coil shows 6 tapings towards the back of the lamp, 200/210/220/230/240/250, with a connector made fast to the specified voltage tapping. Remove the connector (one screw) and replace on the terminal for the next lower voltage, *e.g.* from 230 to 220.
- (f) Replace all parts in reverse order, and test the lamp.

SERVICE AND REPLACEMENTS

(22) **Guaranty.** If our Guaranty has not been sent with the lamp when despatched, you will find a Registration Form in the packing case. After installing the lamp you should sign and send the card attached to that Form, and we will issue our comprehensive Guaranty as covering that lamp. (Registered Medical Practitioners and qualified assistants gain special advantages by thus registering, as detailed in our Medical Prospectus.)

(23) **Arc Tubes** should be replaced after they have given 1,000 hours' operation. As this will extend over many months it is advisable not to rely on memory or guesswork but to keep a written record of operation periods from the time any tube is put into use.

After 1,000 hours a tube will (in most instances) continue to

light and operate. None the less, get it replaced ; the walls of such a tube have lost much of their transparency to ultra-violet and its output becomes more and more an uncertain amount.

In Great Britain the Hanovia repair-exchange plan enables users to keep their lamps in continuous use without interruption of treatments, in this way : When a tube needs replacement, the user should send instructions to the original suppliers, ordering a replacement of Hanovia Arc Tube No..... (read this number on the metal collars of the tube), and stating his name and address. When these instructions reach us, we will despatch a fresh tube as soon as available, with our Guaranty for its satisfactory operation for a fresh period. When the user receives it, he exchanges tubes in the lamp and returns the aged or defective tube to us in the same packing. One inclusive charge covers the service. If an arc tube should fail within the period of our Guaranty but before giving a full thousand hours of operation, the replacement charge may be assessed on the basis of actual use. Overseas, similar arrangements are hardly possible and we recommend the purchase of a spare arc tube with the lamp when first installed.

(24) **Insurance.** All Hanovia equipment can be insured against loss or damage under the special Hanovia policy covered by the Sun Insurance Office Ltd. (Reading Branch). This policy normally covers lamps used at one address in the British Isles.

(25) We hope that the registered user of any Hanovia lamp may be armed with such instructions as will enable him at all times to obtain the best results when using it. If this booklet fails to answer any question which may arise during use, we shall always be ready to give any assistance within our capacity.

HANOVIA LTD.

SLOUGH, BUCKS.

HANOVIA SERVICE

A few hints to users :

Transit Damage : Please unpack and examine this lamp within 48 hours of receipt, as you have no claim on carriers or suppliers outside that period.

Electric Supply : This complete lamp has been tested and found satisfactory for prolonged operation on the actual electric supply and voltage which are specified on the Test Certificate overleaf and is intended for use on such supply only.

Guaranty : Our Guaranty is attached and will be sustained in the spirit of ensuring to every user trouble-free use of his equipment throughout its life.

Hanovia Ltd.

SLOUGH

Form S.2572/4603

TEST CERTIFICATE

O. No.

27790

Hanovia

P/H

Lamp

SBC 7627

(For use at Works.)

Arc Tube No. S.B. 39474 Finally inspected on 9/10/46

S.N. Discharge Tube No. Finally inspected on

Finally inspected on

Tested by 14 on supply of 230 volts A.C./D.C.

Supplier's Name

If at any time the above unit should appear faulty, please return this Certificate with a covering note describing the fault, and stating below through whom the equipment was purchased. Do not return any part pending our instructions.

Guaranty

(Subject to Conditions Overleaf)

We guarantee to replace free of charge any portion of any new Hanovia product which may become defective through faulty manufacture within one year from the date of purchase by the registered user, either directly from us or from an accredited supplier. The faulty part is to be returned to us or to the intermediate suppliers.

This Guaranty is not transferable without our consent. It applies to all parts of Hanovia equipment excepting (a) Sollux Bulbs and Long-wave Elements, which are supplied under such Guarantees as may be issued by their own makers. (b) Accessories, such as Eye Shields, etc.

If the equipment is misused by being operated contrary to the makers' instructions, or if an arc or discharge tube is subjected to unauthorized attempts to repair, this Guaranty becomes void.

HANOVIA LTD.

Date 10.10.46


(Managing Director)

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The Test Certificate furnished with the lamp forms the basis of this Guaranty. On that Card, and on the lamp Control unit, are marked the specified electrical current and voltage. The equipment has undergone a stringent test on this supply, and the user is expected to have these particulars verified. (For replaced Arc and Discharge Tubes, the Record Cards are kept in the Makers' records.)

It is a condition of this Guaranty that equipment shall be operated only in accordance with the Makers' printed instructions. Operation otherwise, and any unauthorized tampering with the Tube or any mechanical part of the unit, would render this Guaranty void.

If any difficulty arises in operation it is usually possible to correct the fault by making the tests described in the Instruction Book. If these fail, or if the fault lies in the arc or discharge tube, the user should communicate first with his suppliers. Should it prove necessary to refer directly to the Makers, please complete and return the Test Certificate. This will ensure prompt attention to the complaint. No parts should be returned unless the Makers so request.

If a tube or burner fails before the expiration of its Guaranty, but after having given a fair period of actual operation, the Makers may make a charge for replacement or repair proportionate to the actual amount of use, and will then issue a fresh Guaranty dating from the time of such replacement or repair.

S 2362



4607

Arc Tube No.

SB. 39474

Control No.

SBC 7624

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Control No.

SBC 7627